Memorandum

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TO: **Michael Cummings, WSDOT Urban Corridors Office**

FROM: **Donald Samdahl**

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RE: **Revenue Estimates for Managed Lanes on I-405**

As part of the assessment of Managed Lane feasibility on I-405, the project team conducted a sketch-level assessment of potential revenues that could be generated with a pricing strategy. The purpose of this analysis was to provide an order-of-magnitude estimate of revenues that could be considered during the decision process on the managed lane concept.

The following assumptions were included in the analysis:

- Two managed lanes in each direction would operate along I-405 between Renton and Bothell
- 2020 Horizon Year
- Operation of the managed lanes would be a variation of Concept #2 (refer to *I-405 Managed Lane Evaluation,* Technical Memorandum, August 2002). Concept #2 operations include peak period limitations to HOV 2+ users, while all users would be eligible for the managed lanes during off-peak periods. For the pricing option summarized in this memorandum, excess capacity during peak periods would be sold to other users. HOV 2+ users would not pay a toll, nor would off-peak tolls be charged.
- The managed lanes would be filled to optimal capacity during peak periods. In essence, it is assumed that the price would be set such that an optimal flow rate would be maintained.
- No Managed Lane expenses were included.

The revenue estimates were produced using the following steps:

1. Estimate peak period (3 hour AM and PM) 'spare capacity' within the managed lanes. Four locations along the corridor were analyzed in each direction of travel. Spare capacity was estimated from traffic distributions in the *Managed Lane Evaluation* report. **Table 1** documents the volumes that were estimated, along with the segment length to which the volumes were applied.

2. Estimate toll rates per mile that matches with general traffic congestion in the non-managed lanes. The range of toll rates was assumed to be $0.10 to $0.40 per mile, using the comparable toll costs documented in the I-405 managed lane study. (Refer to **Figure 1**). Congestion levels were examined for the four screenline locations shown in Table 1. A reasonable toll rate was estimated using professional judgment for each segment and time period using these data.
3. Compute daily toll revenues for the peak period pricing of Single Occupant Vehicles. Table 1 shows that the daily revenues could be in excess of $100,000 (year 2000 dollars excluding expenses)
4. Compute annual revenues by multiplying the daily revenues by 260 days. This resulted in an annual estimate of around $30 Million revenues generated annually by the year 2020.

Conclusions

The managed lane revenue estimates are considered to be relatively conservative (i.e. low) for the following reasons:

- No charge is imposed for HOV's
- No off-peak or weekend charges are imposed
- The revenues are expressed in Year 2000 dollars rather than year of operation dollars

Offsetting these estimates is the fact that operating and maintenance costs for the managed lanes have not been factored into the equation.

Using these caveats and realizing the sketch-planning nature of the analysis, we estimated a range of net annual revenue of around $20 to $40 million per year in 2014 (which was the year selected in the *Regional Toll Analysis* as a mid-point for I-405 implementation).

Additional detailed analysis would be required along I-405 to determine the dynamics of pricing effects on demand and identification of optimal toll rates.

Table 1- I-405 Managed Lane Revenue Worksheet

	AM Peak Period (3 hours)								
Segment	NB Volume	Mi	$/mi	$	SB Volume	Mi	$/mi	$	
Bothell	9,000	5	$ 0.10	$ 4,500	6,000	5	$ 0.20	$ 6,000	
Kirkland	9,000	6	$ 0.10	$ 5,400	1,500	6	$ 0.20	$ 1,800	
Bellevue	3,600	4	$ 0.20	$ 2,880	6,000	4	$ 0.30	$ 7,200	
Newcastle	4,500	7	$ 0.30	$ 9,450	9,000	7	$ 0.20	$ 12,600	

	PM Peak Period (3 hours)								
Segment	NB Volume	Mi	$/mi	$	SB Volume	Mi	$/mi	$	Total $$
Bothell	6,000	5	$ 0.35	$ 10,500	8,400	5	$ 0.20	$ 8,400	29,400
Kirkland	1,500	6	$ 0.40	$ 3,600	6,000	6	$ 0.25	$ 9,000	19,800
Bellevue	4,500	4	$ 0.40	$ 7,200	600	4	$ 0.40	$ 960	18,240
Newcastle	6,900	7	$ 0.35	$ 16,905	3,600	7	$ 0.40	$ 10,080	49,035

3 hour peak periods (2020)
$/mi based upon ranges shown in Figure 1 for optimal toll rates

Daily Revenue	$	116,475
Annual Revenue (260 days)	$	30,283,500

Figure - Comparative Toll Costs